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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,139	09/23/2003	Jayanta Bhattacharyya	98-02c	7573
30699	7590	04/05/2005	EXAMINER	
DAYCO PRODUCTS, LLC 1 PRESTIGE PLACE MIAMISBURG, OH 45342			HON, SOW FUN	
			ART UNIT	PAPER NUMBER
			1772	
DATE MAILED: 04/05/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/671,139	BHATTACHARYYA, JAYANTA	
	<b>Examiner</b>	<b>Art Unit</b>	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 December 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 28-42 and 61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 28,29,32-35,41,42 and 61 is/are rejected.
- 7) ☒ Claim(s) 30-31 and 36-40 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

#### ***Withdrawn Rejections***

1. The obviousness double patenting rejections of claims 28-42 have been withdrawn due to Applicant's terminal disclaimers filed 11/19/04.
2. The 35 U.S.C. 112, 2<sup>nd</sup> paragraph rejection has been withdrawn due to Applicant's amendment filed 12/29/04.
3. The 35 U.S.C. 103(a) rejection of claims 28-30, 32-35, 42, over Ogoe in view of Warren, as evidenced by Reischl, has been withdrawn due to Applicant's amendment filed 12/29/04.

#### ***New Rejections***

##### ***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 28-30, 32-35, 41-42, 61, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogoe et al. (US 5,457,146) in view of Warren et al. (US 5,051,474).

Regarding claims 28-30, 32-35, Ogoe teaches a composition comprising a thermoplastic polyurethane (column 3, lines 15-20), chlorinated polyethylene (column 8, lines 30-35) or chlorosulfonated polyethylene (column 9, lines 15-20), and a peroxide crosslinking agent (column 10, lines 40-45) which crosslinks the chlorinated (or chlorosulfonated) polyethylene (network structure) (column 10, lines 20-30) and forms a thermoplastic vulcanizate. The amount

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of polyurethane is preferably at least 30 parts and not more than about 85 parts (column 2, lines 5-10), which overlaps the claimed range of from 30 to 70-weight %. The amount of chlorinated polyethylene is more preferably at least about 30 parts and not more than about 50 parts (column 2, lines 10-20), which overlaps the claimed range of from 70 to 30-weight %.

Ogoe teaches that the composition is useful in the production of extruded (column 7, lines 60-65) articles of parts and components for use in the automotive industry (column 1, lines 45-55) with a desirable balance of impact and heat resistance properties (column 1, lines 35-40). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have made the thermoplastic vulcanizate capable of withstanding temperatures up to about 300 °F, in order to provide the desired heat resistance properties required by an automotive. The thermoplastic vulcanizate is capable of resisting chemical attack by virtue of its composition.

Ogoe fails to teach that the thermoplastic vulcanizate is made into a hose, that the chlorinated polyethylene and chlorosulfonated polyethylene are mixed together, or a mixture of any of the other claimed chlorinated polyolefins.

Warren teaches a composition comprising a thermoplastic polyurethane (column 3, lines 5-10) in an amount of about 20 to about 90 percent by weight (column 4, lines 20-25) which overlaps the claimed range of from about 30 to 70 weight percent, and a chlorine-containing polyolefin which can be a mixture of chlorinated polyethylene and chlorosulfonated polyethylene (claim 28), chlorinated polyethylene and chlorinated polypropylene (claim 29), chlorosulfonated polyethylene and chlorinated polypropylene (claim 32), chlorinated polyethylene and chlorinated copolymer of ethylene and propylene (claim 33), chlorinated

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polypropylene and chlorinated copolymer of ethylene and propylene (claim 34), chlorosulfonated polyethylene and chlorinated copolymer of ethylene and propylene (claim 35) (column 4, lines 45-60).

Warren teaches mixtures of these chlorine-containing polyolefins (column 4, lines 55-60) present in the amount of from about 0.2 to about 60 percent by weight (column 5, lines 1-10). The crosslinking agent used is a polyisocyanate (column 6, lines 25-35) which crosslinks the thermoplastic polyurethane in the thermoplastic vulcanizate.

Warren teaches that the thermoplastic vulcanizates (elastomers) (column 1, lines 35-40) are used in hoses (column 2, line 6), and are exceptionally water and heat-resistant (column 3, lines 1-5). Both Ogoe and Warren are directed to thermoplastic vulcanizates, and are hence analogous art. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the chlorine-containing polyolefin mixtures taught by Warren, in place of the single chlorinated polyolefin or chlorosulfonated polyolefin in the thermoplastic vulcanizate of Ogoe, in order to obtain an extruded hose with the desired high performance required in automobiles, which is capable of withstanding temperatures up to 300 °F, for prolonged periods of time, and is exceptionally water-resistant at those temperatures, as taught by Warren.

Regarding claim 41, Ogoe teaches that the extruder can be used as a reactor (column 7, lines 64-66), which means that the article of Ogoe is being crosslinked while it is being extruded. Therefore the thermoplastic polyurethane in the hose of Ogoe in view of Warren, is crosslinked in the matrix by dynamic vulcanization during the manufacture of the hose.

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Regarding claim 42, Ogoe teaches a peroxide crosslinking agent (column 10, lines 40-45), but not the Markush group component of an isocyanate having a functionality of more than 2.0.

Warren teaches that the crosslinking agent used for the thermoplastic vulcanizate is a polyisocyanate (column 6, lines 25-35) which crosslinks the thermoplastic polyurethane. Polyisocyanate is an isocyanate having a functionality of more than 2.0.

Both Ogoe and Warren are solving a common problem of crosslinking a thermoplastic vulcanizate, and are thus analogous art.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the polyisocyanate crosslinking agent of Warren in place of the peroxide crosslinking agent of Ogoe, for crosslinking the thermoplastic polyurethane in the matrix, in order to obtain the desired physical properties caused by the crosslinking of the polyurethane.

Regarding claim 61, Ogoe teaches that the extruded article is for use in an automotive (column 1, lines 45-55) and has a desirable balance of impact and heat resistance properties (column 1, lines 35-40). Therefore, although Ogoe in view of Warren fails to teach that the extruded hose is an automotive power steering hose, because Ogoe teaches that the extruded article is used in an automotive and has the desired balance of impact and heat resistance properties, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have made the extruded hose of Ogoe in view of Warren, into an automotive power steering hose with the desired high performance required by an automotive.

*Response to Arguments*

6. Applicant's arguments with respect to claims 28-30, 32-35, 41-42, 61 have been considered but are moot in view of the new ground(s) of rejection.

7. Applicant's arguments with respect to the validity of Warren as a secondary reference are addressed here in order to advance prosecution.

8. Applicant contends that Warren teaches a new class of melt processible thermoplastic elastomers based on the compatible blends of an ethylene copolymer and a vinyl or vinylidene halide which are particularly effective in applications involving hoses, which are not comparable to the components of Applicant.

Applicant is respectfully apprised that the term "comprising" in the claim limitation of "hose having a matrix comprising a thermoplastic vulcanizate comprising ..." is open-ended, and does not preclude other components present in the hose. Ogoe is the primary reference which teaches extruded (column 1, lines 45-55) automotive articles comprising the thermoplastic vulcanizate of polyurethane (column 3, lines 15-20) and chlorinated polyolefin (column 8, lines 30-35) or chlorosulfonated polyethylene (column 9, lines 15-20). Warren is the secondary reference which teaches a thermoplastic vulcanizate mixture comprising thermoplastic polyurethane (column 3, lines 5-10) in an amount of about 20 to about 90 percent by weight (column 4, lines 20-25), and a chlorine-containing polyolefin which can be a mixture of chlorinated polyethylene and chlorosulfonated polyethylene, chlorinated polyethylene and chlorinated polypropylene, chlorosulfonated polyethylene and chlorinated polypropylene, chlorinated polyethylene and chlorinated copolymer of ethylene and propylene, chlorinated

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polypropylene and chlorinated copolymer of ethylene and propylene, chlorosulfonated polyethylene and chlorinated copolymer of ethylene and propylene (column 4, lines 45-60).

Warren teaches that the thermoplastic vulcanizates (elastomers) (column 1, lines 35-40) are used in hoses (column 2, line 6), and are exceptionally water and heat-resistant (column 3, lines 1-5). Both Ogoe and Warren are directed to thermoplastic vulcanizates, and are hence analogous art. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the chlorine-containing polyolefin mixtures taught by Warren, in place of the single chlorinated polyolefin or chlorosulfonated polyolefin in the thermoplastic vulcanizate of Ogoe, in order to obtain an extruded hose with the desired high performance required in automobiles, which is capable of withstanding temperatures up to 300 °F, for prolonged periods of time, and is exceptionally water-resistant at those temperatures, as taught by Warren.

*Allowable Subject Matter*

4. Claims 30-31, 36-40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The closest prior art of record, US 5,457,146, even in combination with US 5,051,474 and US 3,243,475, fails to teach or suggest, an extruded high performance, chemical resistant hose which withstands temperatures up to about 300 F, for prolonged periods of time, said extruded high performance, chemical resistant hose having a matrix comprising a thermoplastic vulcanizate comprising:



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1) a thermoplastic polyurethane in an amount of about 30 to 70 weight % of said thermoplastic vulcanizate, wherein the thermoplastic polyurethane is crosslinked in said matrix; and

2) a chlorine-containing polyolefin in an amount of about 30 to 70 weight % of said thermoplastic vulcanizate, wherein said chlorine-containing polyolefin is a mixture of:

- a) chlorosulfonated polyethylene and chlorosulfonated polypropylene; or
- b) chlorinated polyethylene and chlorosulfonated polypropylene; or
- c) chlorosulfonated polypropylene and a chlorinated copolymer of ethylene and propylene; or
- d) chlorinated polyethylene and chlorosulfonated copolymer of ethylene and propylene; or
- e) chlorosulfonated polyethylene and a chlorosulfonated copolymer of ethylene and propylene; or
- f) chlorosulfonated polypropylene and a chlorosulfonated copolymer of ethylene and propylene.

US 6,623,822 cannot be applied as prior art due to the terminal disclaimer filed 11/19/04.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*S. Hon.*

Sow-Fun Hon

03/31/05

*[Signature]*  
HAROLD PYON  
SUPERVISORY PATENT EXAMINER  
*CMR*

4/1/05